



Conservation Practice Standard 605

Producer HIGHLIGHTS Dentrifying Bioreactors

Arlo Van Diest is a leading conservationist in Hamilton County, Iowa. He has been using strip-tillage to grow corn for over a decade, making him an early adopter in an area where heavy, wet soils make no-till farming a challenge. Van Diest also has been experimenting with cover crops on part of his acreage.

Starting in 2010, Van Diest installed the first of two denitrifying bioreactors on his farm. The two bioreactors filter approximately 120 acres of the 2,000 that Van Diest farms. The second bioreactor was installed with financial assistance from NRCS's Mississippi River Basin Initiative, and included funding for water quality monitoring to assess the performance of the bioreactor.

As an early adopter, Van Diest has talked with many farmers in the area interested in the bioreactors.

"We've had a lot of people, particularly from around the Boone Watershed, interested in our two bioreactors. With water quality a hot topic in this region, I certainly get a lot of questions about how it works."

From 2010 to 2014, Van Diest's bioreactors have, on average, removed 41 percent of the nitrates moving through the wood chips. Performance has waxed and waned from year to year, based largely on rainfall patterns.



Arlo Van Diest started strip-till in 2002, shortly after learning about it at the Commodity Classic in Florida.

"I don't think bioreactors are the end-all answer to improving water quality, but they are doing some good on those drainage acres, and they are a means to learning about water draining from our tile," says Van Diest. "I think bioreactors are good combined with other practices, like strip-till or no-till and grassed waterways. All farmers ought to be doing something to reduce soil erosion and improve water quality. I am just doing my part."

Characteristics of Dentrifying Bioreactors

- Bioreactors have no adverse effects on crop production and do not restrict drainage;
- Provide an organic last line of defense against subsurface nitrates;
- Remove 35-50 percent of nitrates from water flowing through it;
- Relatively inexpensive to install and maintain.



Arlo Van Diest uses his strip-till planter to plant soybeans into corn residue on at his field in northern Hamilton County. Strip-till opens up a small path for seedbed and fertilizer application, but leaves the rest of the field 90 to 100 percent covered with residue.

